

METHOD FOR ASSAYING CLUSTERED DNA DAMAGES

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4/27/04 This application claims benefit of US provisional Application 60/198,681, filed Apr 20, 2000.

1 A The present invention was made with Government support
under contract number DE-AC02-98CH10886, awarded by the
5 U.S. Department of Energy. The Government has certain
rights in the invention.

Background of the Invention

10 Ionizing radiation may produce cancer, death and loss
of neural function in humans and animals, and induce
killing, mutation and chromosomal aberrations in cells
[Bissell et al., (1997) *Modeling Human Risk: Cell and
Molecular Biology in Context*, Lawrence Berkeley National
Laboratory, Univ. of California, Berkeley]. Humans are
15 exposed to low doses of radiation during air travel, from
radon in homes, during space travel or in areas of low-
level contamination, including former nuclear weapon
production sites. Nuclear energy production facility
workers may encounter higher doses of ionizing radiation
20 than others. In addition, humans encounter higher
radiation doses during radiotherapy and humans, animals and
plants encounter much higher radiation doses in
contaminated areas such as Chernobyl and near the sites of
other nuclear mishaps [Bissell, 1997; Yang et al.,
25 *Radiation Res.* 148 (Sup. 5): S17 (1997); Tucker et al.,
Radiation Res. 148: 216 (1997); Bigbee et al., *Radiation
Res.* 147: 215 (1997); Fry et al., *Radiation Res.* 150: 695
(1998)].

30 Ionizing radiation induces many different types of DNA
damages [Wallace, *Radiation Res.* 150 (Sup. 5): S60 (1998)]
and the identity of the specific lesion types that are
responsible for the biological effects of radiation remains